

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

1. (Cancelled)

2. (Currently Amended) ~~The~~ A cluster system according to claim 1, further comprising:

a plurality of computers;

a data storage device;

a cluster file system providing exclusive control for maintaining data consistency by using a lock function in order to offer shared access to a file recorded on the data storage device from a process operating on the plurality of computers;

means for allocating a memory area in an address space of the process as cluster shared memory and for mapping data of files managed by the cluster file system in the allocated area;

means for allocating a cluster shared memory lock corresponding to the lock function of the cluster file system and enabling exclusive read and write access to the mapped data in the shared memory area for maintaining data consistency on the shared memory;

access inhibit setting means for inhibiting an access to all pages in the allocated shared memory;

~~data write~~ accessing means, when accessing ~~the an~~ access-inhibited page causes a read page fault, for reading the data mapped to the page from the file recorded on the data storage device and writing the read data on the page; and setting means for read-enabling the page where the data is ~~written to be readable~~ accessed.

3. (Currently Amended) ~~The~~ A cluster system according to claim 1, further comprising:

a plurality of computers;
a data storage device;
a cluster file system providing exclusive control for maintaining data consistency by using a lock function in order to offer shared access to a file recorded on the data storage device from a process operating on the plurality of computers;
means for allocating a memory area in an address space of the process as cluster shared memory and for mapping data of files managed by the cluster file system in the allocated area;
means for allocating a cluster shared memory lock corresponding to the lock function of the cluster file system and enabling exclusive read and write access to the mapped data in the shared memory area for maintaining data consistency on the shared memory;
access inhibit setting means for inhibiting access to all pages in the allocated shared memory;

data write means, when accessing the an access-inhibited page causes a write page fault, for reading the data mapped to the page from the file recorded on the data storage device and writing the read data on the page; and

setting means for read-enabling and write-enabling the page where the data is written.

4. (Original) The cluster system according to claim 3, further comprising:
means for acquiring a lock, when the cluster shared memory is locked, by access-inhibiting a page in a cluster shared memory area where a file managed by the cluster file system is mapped in the address space for the process; and
means for writing data of an updated page in the cluster shared memory area back to a file managed by the cluster file system when the acquired lock is unlocked.

5. (Cancelled)

6. (Currently Amended) ~~The~~ A memory access control method ~~according to~~ ~~claim 5, further applied to a cluster system having a plurality of computers, a data storage device, and a cluster file system providing exclusive control for maintaining data consistency by means of a lock function in order to allow shared access from a process operating on the plurality of computers to a file recorded in the data storage device, the~~ method comprising the steps of:

allocating a memory area in an address space of the process as cluster shared memory and mapping data of files managed by the cluster file system in the allocated area;

allocating a cluster shared memory lock corresponding to the lock function of the cluster file system and enabling exclusive read and write access to the mapped data in the shared memory area for maintaining data consistency on the shared memory;

inhibiting ~~an~~ access to all pages in the allocated shared memory;

when accessing ~~the~~ ~~an~~ access-inhibited page causes a read page fault, reading the data mapped to the page from the file recorded on the data storage device and writing the read data on the page; and

read-enabling the page where the data is ~~written to be readable~~ accessed.

7. (Currently Amended) ~~The~~ A memory access control method ~~according to claim 5, further~~ applied to a cluster system having a plurality of computers, a data storage device, and a cluster file system providing exclusive control for maintaining data consistency by means of a lock function in order to allow shared access from a process operating on the plurality of computers to a file recorded in the data storage device, the method comprising the steps of:

allocating a memory area in an address space of the process as cluster shared memory and mapping data of files managed by the cluster file system in the allocated area;

allocating a cluster shared memory lock corresponding to the lock function of the cluster file system and enabling exclusive read and write access to the mapped data in the shared memory area for maintaining data consistency on the shared memory;

inhibiting access to all pages in the allocated shared memory;

when accessing the access-inhibited page causes a write page fault, reading the data mapped to the page from the file recorded on the data storage device and writing the read data on the page; and

read-enabling and write-enabling the page where the data is written.

8. (Original) The memory access control method according to claim 7, further comprising the steps of:

acquiring a lock, when the cluster shared memory is locked, by access-inhibiting a page in a cluster shared memory area where a file managed by the cluster file system is mapped in the address space for the process; and

writing data of an updated page in the cluster shared memory area back to a file managed by the cluster file system when the acquired lock is unlocked.

9. (Cancelled)

10. (Currently Amended) ~~The~~ A recording medium according to claim 9, wherein the program code further comprises: storing computer-executable program code for memory access control in a cluster system having a plurality of computers, a data storage device, and a cluster file system providing exclusive control for maintaining data

consistency by means of a lock function in order to allow shared access from a process
operating on the plurality of computers to a file recorded in the data storage device, the
program code comprising:

means for causing a computer to allocate a memory area in an address space for
the process as cluster shared memory and map data of a file managed by the cluster
file system to the allocated area;

means for causing a computer to allocate a cluster shared memory lock
corresponding to the lock function of the cluster file system and enable exclusive read
and write access to the mapped data in the shared memory area for maintaining data
consistency on the shared memory;

means for causing a computer to inhibit access to all pages in the allocated
shared memory;

means for causing, when accessing the access-inhibited page causes a read
page fault, a computer to read the data mapped to the page from the file recorded on
the data storage device and write the read data on the page; and

means for causing a computer to read-enable the page where the data is ~~written~~
~~to be readable~~ accessed.

11. (Currently Amended) ~~The~~ A recording medium according to claim 9, wherein
~~the program code further comprises: storing computer-executable program code for~~
~~memory access control in a cluster system having a plurality of computers, a data~~
~~storage device, and a cluster file system providing exclusive control for maintaining data~~
~~consistency by means of a lock function in order to allow shared access from a process~~

operating on the plurality of computers to a file recorded in the data storage device, the program code comprising:

means for causing a computer to allocate a memory area in an address space for the process as cluster shared memory and map data of a file managed by the cluster file system to the allocated area;

means for causing a computer to allocate a cluster shared memory lock corresponding to the lock function of the cluster file system and enable exclusive read and write access to the mapped data in the shared memory area for maintaining data consistency on the shared memory;

means for causing a computer to inhibit access to all pages in the allocated shared memory;

means for causing, when accessing the access-inhibited page causes a write page fault, a computer to read the data mapped to the page from the file recorded on the data storage device and write the read data on the page; and

means for causing a computer to read/write-enable the page where the data is written.

12. (Original) The recording medium according to claim 11, wherein the program code further comprises:

means for causing a computer to acquire a lock, when the cluster shared memory is locked, by access-inhibiting a page in a cluster shared memory area where a file managed by the cluster file system is mapped in the address space for the process; and

means for causing a computer to write data of an updated page in the cluster shared memory area back to a file managed by the cluster file system when the acquired lock is unlocked.